



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

May 05, 2020

MEMORANDUM TO: Tara Inverso, Acting Deputy Director  
Division of Fuel Management  
Office of Nuclear Materials Safety and Safeguards

FROM: Paul Kallan, Project Manager */RA/*  
New Reactor Licensing Branch  
Division of New and Renewed Licenses  
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF THE APRIL 15 - 16, 2020, CATEGORY 1 PUBLIC  
WORKSHOP ON SPENT FUEL PERFORMANCE MARGINS

On April 15 - 16, 2020, the U.S. Nuclear Regulatory Commission (NRC) held a Category 1 public workshop with the Nuclear Energy Institute (NEI) and other industry representatives to discuss NEI's white paper on Spent Fuel Performance Margins (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19318D971). The workshop built upon discussions held during the January 22, 2020 public workshop (ADAMS Accession No. ML20028F277) and March 25-26, 2020 public workshop (ADAMS Accession No. ML20106F135). On April 15, 2020, the meeting focused on three technical areas: dose rates, graded acceptance review process, and review approaches when Phenomenon Identification and Ranking Tables (PIRTs) are used in applications. The attendees aligned on detailed problem statements for the associated recommendations, planned regulatory products, and next steps. On April 16, 2020, representatives from the Electric Power Research Institute (EPRI) presented recommendations for future work related to gross rupture (e.g., determining the safety goal and clarifying the interpretation). Approximately 55 individuals from industry, vendor groups, public citizens, and NRC staff attended the workshop (some participating in portions only) via Skype and bridgeline. The NRC staff is planning future workshops to continue efforts on the white paper recommendations; the next will likely be scheduled in late May and June 2020.

The public workshop notices dated April 2020, can be found in ADAMS under Accession Nos. ML20092G337 and ML20092H164. These meeting notices were also posted on the NRC public website. Enclosed is the meeting agenda (Enclosure 1), list of participants (Enclosure 2), an overview of the meeting (Enclosure 3) and a Table providing a summary of the discussion surrounding the problem statements, requested regulatory products, and next steps (Enclosure 4).

NRC's presentation materials are available in ADAMS:

- Recommendation II-1 (Category II) RIRP for grading reviews: ADAMS Accession No. ML20099A149
- Recommendations IV-2 (Category 2) RIRP: ADAMS Accession No. ML20099A154

NEI's presentation materials are available in ADAMS:

- NEI Workshop Introduction: ADAMS Accession No. ML20104A589
- RIRP on Dose Rate: ADAMS Accession No. ML20100F221
- Presentation on Dose Rate Recommendations: ADAMS Accession No. ML20105A002

Electric Power Research Institute (EPRI)'s presentation material is available in ADAMS:

- Gross Rupture Presentation: ADAMS Accession No. ML20106E952

In terms of next steps, the NRC is planning on conducting future workshops, as tentatively outlined below:

- Reprioritization of Thermal Recommendations, Gross Rupture, Remaining Category 3 Items (~ May 2020)
- Source Term Options, Graded Acceptance Reviews (~ June 2020)

These workshops will be posted to the NRC's public meeting website in advance of each meeting date.

Enclosures:

1. Meeting Agenda
2. List of Attendees
3. Meeting Overview
4. Table

CONTACT: Paul Kallan, NRR/DNRL  
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WORKSHOP ON SPENT FUEL PERFORMANCE MARGINS  
DATE: MAY 05, 2020.

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**ADAMS Accession No.: ML20126G388    \*via email****NRR-106**

OFFICE	DNRL/NRLB/PM	NRR/DRO/Special Assistant	DNRL/NRLB/PM
NAME	PKallan	TInverso*	PKallan (signed)
DATE	05/05/20	05/05/20	05/05/20

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**U.S. NUCLEAR REGULATORY COMMISSION**

**CATEGORY 1 PUBLIC WORKSHOP ON SPENT FUEL PERFORMANCE MARGINS**

**PUBLIC MEETING AGENDA**

**April 15, 2020**

<b><i>Time</i></b>	<b><i>Topic</i></b>	<b><i>Speaker</i></b>
9:00 AM	Introductions/Opening Remarks	NRC/NEI
TBD	Break (as needed)	
9:15 AM	Industry Presentations on Dose Rates (Recommendations V-1 and V-2): Draft Regulatory Issue Resolution Plans (RIRPs)	NEI
12:00 PM	Break for Lunch	
1:00 PM	NRC Presentation on Graded Acceptance Reviews (Recommendation II-1): Draft RIRP  NRC Presentation on Review Approaches when PIRTs are used in an application (Recommendation IV-2): Draft RIRP	NRC
TBD	Break (as needed)	
3:30 PM	Opportunity for Public Comment	All
3:50 PM	Closing Remarks	NRC/NEI
4:00 PM	Meeting Adjourn	

**U.S. NUCLEAR REGULATORY COMMISSION**

**CATEGORY 1 PUBLIC WORKSHOP ON SPENT FUEL PERFORMANCE MARGINS**

**PUBLIC MEETING AGENDA**

**April 16, 2020**

<b><i>Time</i></b>	<b><i>Topic</i></b>	<b><i>Speaker</i></b>
1:00 PM	Introductions/Opening Remarks	NRC/NEI
1:10PM	Presentation on recommendations for future work on the interpretation and guidance related to gross rupture (10 CFR 72,122(h))	EPRI
2:00 PM	Opportunity for Public Comment	All
3:50 PM	Closing Remarks	NRC/NEI
4:00 PM	Meeting Adjourn	

**U.S. NUCLEAR REGULATORY COMMISSION**

**CATEGORY 1 PUBLIC WORKSHOP ON SPENT FUEL PERFORMANCE MARGINS**

**LIST OF ATTENDEES**

**April 15 - 16<sup>th</sup>, 2020**

<b>Name</b>	<b>Organization</b>
Andrea Kock	U.S. Nuclear Regulatory Commission (NRC)
Tara Inverso	NRC
Yaira Diaz	NRC
Paul Kallan	NRC
Donald Chung	NRC
John McKirgan	NRC
Jorge Solis	NRC
Meraj Rahimi	NRC
Joann Ireland	NRC
Timothy McCarthy	NRC
John Wise	NRC
Chris Bajwa	NRC
Haile Lindsay	NRC
Jason Piotter	NRC
April Smith	NRC
Brian Wagner	NRC
Veronica Wilson	NRC
Donnie Harrison	NRC
David Decker	NRC
Jimmy Chang	NRC
Darrell Dunn	NRC
David Tarantino	NRC
On Yee	NRC
Ray Kellar	NRC
Arlette Howard	NRC
Alana Bell	NRC
Kenneth Armstrong	NRC
Casper Sun	NRC
Brian Wagner	NRC
Patricia Jehle	NRC
Zhian Li	NRC
Ricardi Rodriguez	NRC
Ahn Tae	NRC
Ricardo Torres	NRC
Rod McCullum	Nuclear Energy Institute (NEI)
Mark Richter	NEI
Jana Bergman	Curtis Wright
Tom Tramm	Certrec
William Szymcak	Energy Solutions

Aladar Csontos	Electric Power Research Institute (EPRI)
Hatice Akkurt	EPRI
Keith Waldrop	EPRI
Jack Desando	Exelon
Michael Ford	Ford ES&H Solutions
Stefan Anton	Holtec International
Stanley Orrell	INL
Don Shaw	TN Orano
Rick Miliore	TN Orano
Glenn Schwartz	PSEG Nuclear
Paul Plante	The Yankee Companies
Steven Baker	Transware
Zita Martin	TVA
Robert Quinn	Westinghouse
Donna Gilmore	Public
Jan Boudart	Public

## **U.S. NUCLEAR REGULATORY COMMISSION**

### **CATEGORY 1 PUBLIC WORKSHOP ON SPENT FUEL PERFORMANCE MARGINS**

On April 15 - 16, 2020, the U.S. Nuclear Regulatory Commission (NRC) held a Category 1 public workshop with the Nuclear Energy Institute (NEI) and other industry representatives to discuss NEI's white paper on Spent Fuel Performance Margins (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19318D971). The workshop built upon discussions held during the January 22, 2020 public workshop (ADAMS Accession No. ML20028F277) and March 25-26, 2020 public workshop (ADAMS Accession No. ML20106F135). On April 15, 2020, the meeting focused on three technical areas: dose rates, graded acceptance review process, and review approaches when Phenomenon Identification and Ranking Tables (PIRTs) are used in applications. The attendees aligned on detailed problem statements for the associated recommendations, planned regulatory products, and next steps. On April 16, 2020, representatives from the Electric Power Research Institute (EPRI) presented recommendations for future work related to gross rupture (e.g., determining the safety goal and clarifying the interpretation). Approximately 55 individuals from industry, vendor groups, public citizens, and NRC staff attended the workshop (some participating in portions only) via Skype and bridgeline. The NRC staff is planning future workshops to continue efforts on the white paper recommendations; the next will likely be scheduled in late May and June 2020.

In the morning session on April 15, 2020, NEI presented opening remarks for workshops on the White Paper, which included the following stated goals:

- Maintain focus on public health and safety
- Utilize risk principles and graded approach
- Understand the role of margins in licensing
- Transform NRC and industry licensing practices
- Enable flexibility to enhance safety

Industry then made a presentation on Radiation Safety and discussed proposed guidance revisions intended to focus industry and staff resources on radiological issues of highest safety significance. This presentation provided the basis for industry's recommendations V-1 and V-2 in the White Paper.

Following this presentation, NEI discussed its draft RIRP Recommendations V-1 and V-2 related to revised guidance to reflect application of realistic dose rates and modeling of dose rates to recognize operating experience from loaded dry storage systems (Recommendations V-1, V-2 (Category 3)).

In the afternoon session, the NRC presented its draft RIRP on graded acceptance reviews (Recommendation II-1). The staff discussed an acceptance review grading process that would assign varying levels of review to an application based on risk insights. Next, the NRC presented its draft RIRP on review approaches when Phenomena Identification and Ranking Table (PIRT)s are used (Recommendation IV-2).

Next the NRC and industry discussed a few action items from the meeting which are as follows:

- NEI: Share how operating experience could be presented as part of industry spent fuel licensing applications
- NRC: Make source term options and pros/cons (in response to Recommendation III-3) publicly available before the next workshop on that topic
- NRC: Respond to several questions related to NUREG-2152 at the next workshop, including how the NUREG is used, whether it went through a public review process, and whether the level of effort described is commensurate with the safety goal

At the end of the day, the NRC staff provided an opportunity to the public to provide any comments or questions. There were no comments from the public on topics discussed at the meeting.

In the afternoon of April 16, 2020, EPRI delivered a presentation on the background and history of gross rupture. The attendees discussed the following next steps:

- Determine safety goal for gross rupture (NRC action)
- NRC agreed to utilize and participate in the PIRT process to define gross rupture
- Develop actionable performance metrics to address the safety goal

At the end of the meeting, the NRC staff provided an opportunity to the public to provide any comments or questions. There were four comments from the public that were that were addressed at the meeting.

**Summary Table:  
April 15-16 Workshop on Spent Fuel Performance Margins**

Topic	Recommendation	Lead	Problem Statement (short)	Requested Regulatory Product	Next Milestone
Dose Rates	V-1 and V-2	NEI	Explore whether changes to NUREG-1536 and NUREG-2215 could enhance ways that applicants demonstrate (and the NRC reviews) compliance with radiological safety requirements (25 mrem/year site at boundary, 5 rem/year per person)	<p>Revisions to NUREG-1536 and NUREG-2215. (Note: NUREG-2215 will subsume NUREG-1536.)</p> <ul style="list-style-type: none"> <li>• Industry proposal: In FSAR, provide dose rates for a typical cask design with representative content. Associated analyses establish methodology to determine site boundary dose.</li> <li>• Consider changes to occupational exposure evaluations</li> <li>• Review and revise guidance on modeling, considering operating experience</li> </ul>	<p><b>** Consider staff's work on recommendation III-3 as part of path forward on V-1 and V-2. Merge into future workshop (TBD for June/July 2020)**</b></p> <p>Develop proposed changes to NUREG-2215. (Industry lead)</p> <p>Provide indication of how experience-based information would be presented as part of the application (graded review)</p> <p>Conduct public meetings to discuss proposed changes and close gaps in any areas of misunderstanding.</p>
Graded Acceptance Reviews	II-1	NRC	Should applications be assigned varying levels of NRC review based on incorporated risk insights?	Revisions to (or New) Review Guidance	<p>Develop a high-level draft grading process</p> <p>Conduct a public workshop</p> <p>Pilot approach</p>

**Summary Table:**  
**April 15-16 Workshop on Spent Fuel Performance Margins**

Review Approaches when PIRT's are Used in an Application	IV-2	NRC	When applicants apply the results of a PIRT in applications (via a topical report), should NRC limit its review to verifying that the results of the PIRT have been applied appropriately?	Revisions to (or New) Review Guidance	Perform a peer review of PIRT implementation (once the three PIRTs (plus gross rupture) are available and implementation guidance is available) <ul style="list-style-type: none"> <li>Also – industry will revise its RIRP on IV-1, IV-3, IV-4, and IV-5</li> </ul>
NRC develop safety goal definition as precedent action for the gross rupture definition PIRT		NRC			Conduct a public workshop to discuss results of NRC's peer review
					Develop draft review guidance
					NEI will submit a letter with insights relative to the safety goal development.
NRC and EPRI will form a PIRT team to develop an actionable definition of gross rupture and associated fuel metrics		NRC/EPRI			

**Summary Table:**  
**April 15-16 Workshop on Spent Fuel Performance Margins**

Potential Future Workshop Timeline	Potential Topics
June/July 2020*	<p>Graded Acceptance Reviews</p> <ul style="list-style-type: none"> <li>• Review draft approach (if available)</li> </ul> <p>Thermal Margins (IV-1 through IV-5, with the exception of IV-3)</p> <ul style="list-style-type: none"> <li>• Review industry updated RIRP for IV-1 through IV-5</li> <li>• Present PIRT reports</li> <li>• NRC to present safety goal with respect Gross Rupture</li> </ul> <p>Dose Rates</p> <ul style="list-style-type: none"> <li>• NRC options for source term reviews (III-3)</li> <li>• Industry changes to NUREG-2215 (V-1 and V-2)</li> </ul> <p>Remaining Category 3 Items</p>

\* These workshops may be as early as May/June 2020.